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Weekly Bulletin



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GUY P. JONES
EDITOR

What Every Person Should Know About Milk

By LESLIE C. FRANK, Sanitary Engineer in Charge, Office of Milk Investigations, United States
Public Health Service

Of all things of life which affect human welfare none is more important than food. Food is to man what coal is to the furnace or gasoline to the automobile. Food furnishes man with internal heat, without which even overcoats would not keep him warm. Properly selected food provides mankind with the mental and physical energy which has been the main-spring of all civilization, it repairs the structural damage which the wear and tear of life inflict upon our bodies, and it helps make us resistant to disease. On the other hand, improperly selected food is responsible for a large proportion of human ills, from a simple stomach ache to the shortening of life itself. In short, food is all-important in the human economy.

Of all of the kinds of food none is more important than milk, the principal food of infants and small children. There are three important questions about milk which every person should be able to answer. They are:

- (1) Why is milk such an excellent food, and how much of it should be included in the diet?
- (2) How can milk be safeguarded to prevent it from transmitting disease?
- (3) How can consumers be certain that the milk they drink has been thus safeguarded?

- (1) *Why is milk such an excellent food, and how much of it should be included in the diet?*

In the first place milk is the only food specifically prepared by nature for the young of mammals. Nearly everyone will immediately agree that a substance specifically prepared by nature for no other purpose than for food is most likely to contain the food elements needed to sustain life and justly deserves the title recently conferred upon it, namely, "the most nearly perfect food."

It is by no means sure that we know all of the attributes which the perfect food should have, but we can at least discuss some of them.

It will be obvious that one of the most important attributes which a food should possess is that it be a good source of energy, since every living thing needs a fresh supply of energy every day. Milk is such a food and, furthermore, is a cheap form of energy. The equivalent energy value in the form of certain other widely used foods is more expensive.

Milk is also a good muscle builder. It is rich in protein, which is required for muscle building. A child can not grow and form strong muscles without protein. A full-grown adult can not keep in health without it. As to the quantity of protein available in milk, Rose states: "A quart of milk yields more than an ounce of pure protein of the highest quality,"

that is, more than one-third of the total daily protein requirement of an adult.

Again, milk is a good tooth and bone builder, for it contains plenty of lime. Children particularly need lime, and the lime should be in a form which is easily utilized by the body. This is above all true of the lime in milk. One cup of milk contains as much lime as $3\frac{1}{2}$ cups of carrots, 7 eggs, or 42 slices of bread.

Milk is a far more concentrated food from the standpoint of solids than most of us imagine. We think of milk as a liquid not much above the consistency of water; but it contains 13 per cent of solids by weight, which is more than is contained in onions, beets, carrots, squash, pineapple, turnips, oysters, cabbage, radishes, cauliflower, spinach, watermelon, pumpkin, tomatoes, asparagus, celery, lettuce or cucumbers. When we buy 1 pint or 1 pound of milk, therefore, we buy more actual dry solid food than when we buy 1 pound of any of the other above-mentioned foods.

Milk is also an excellent source of fat. This, of course, is obviously in the form of cream, which, with the milk sugar, is directly related to its fuel value.

Milk is an excellent source of vitamin A. Professor Sherman of Columbia University, one of the outstanding diet specialists of the world, has stated, as a result of his own extensive research, that "milk is the most important of all foods as a source of vitamin A." The same author has stated, in his book on "Chemistry of Food and Nutrition": "Of the three vitamins A, B, and C, vitamin A is the factor of greatest practical importance to nutrition and health, because so many of our staple foods are poor in vitamin A, and because a dietary poor in this vitamin causes such widespread weakening of the body and increases its susceptibility to so many infectious diseases."

In the January, 1932, issue of the *American Journal of Public Health*, the work of Professor Mellenby and his wife on vitamin A (*British Medical Journal*, Oct. 3, 1931) was discussed. As a result of their work with 550 pregnant women, these authors reported a significant reduction in morbidity following the administration of a preparation containing vitamins A and D; and the authors conclude, on the experimental evidence, that the vitamin-D fraction had little to do with the results.

Again, Professor Mellenby and his wife have for some five years taken cod-liver oil (a rich source of vitamin A) daily and report that during this time they have been practically free from ordinary colds. This latter, as the editor of the *Journal* says, is of course not a controlled experiment; but the work on pregnant women was controlled, as 275 of the women

received the vitamin A preparation and the remaining 275 did not. These statements are very interesting in view of the widespread feeling that vitamin A gives protection against infection.

Milk seems also to be a good source of vitamin G. This vitamin, as the result of the renowned work of the late Surg. Joseph Goldberger of the Public Health Service, has been found to be valuable both in preventing and in curing pellagra, a dietary deficiency disease. Since milk contains vitamin G, the consumption of milk has been stressed by Goldberger and others as one important measure for combating pellagra.

Finally, milk is one of the most digestible of foods. It is easily and completely digested by most persons. Crumbine and Tobey state that the coefficient of digestibility of milk is from 97 to 98 per cent.

It may be asked why milk was called the most nearly perfect food rather than "the perfect food." This is because, while it is the most nearly perfect food, it is not absolutely perfect, and what has been said would not be complete without reference to its shortcomings. Milk does not seem to be an entirely dependable source of the other vitamins, nor does it contain sufficient iron, and experiments have shown that infants and young animals restricted entirely to milk over considerable periods of time develop anemia.

For this reason, and also because variety in the diet stimulates the appetite, we should not try to live on milk alone. The diet of normal children should include a quart of milk daily, supplemented with a wise selection of other foods, among which should be included orange juice, cod-liver oil and green vegetables. Normal adults may wisely include at least a pint of milk in their daily diet. Of course, abnormal adults or children should receive and follow competent medical advice.

It seems reasonable to believe that in the future public health officials will not always grade milk on the basis of its cleanliness and safety alone, but will also grade it with reference to its nutritive value. Recently it has become quite apparent that the kind of feed a cow gets very much affects the nutritive value of the milk she gives. Therefore it may be anticipated that some time in the future grade A milk may be required to have been produced by cows which receive at least a standard balanced ration so that their milk may possess the maximum food value for human beings.

(2) *How can milk be safeguarded to prevent it from transmitting disease?*

It seems a pity that milk can be such an excellent

food and at the same time so dangerous if not properly safeguarded. But it is unfortunately true that milk is not only a good food for human beings, but also a good food for certain types of disease organisms, such as those causing typhoid fever and diphtheria. Then, again, milk may sometimes, without our knowledge, come from sick cows. In such cases their milk may at the time of milking contain large numbers of the organisms of such diseases as septic sore throat, undulant fever, and tuberculosis.

Occasionally there occur milk-borne outbreaks of appalling magnitude. Only a few years ago a milk-borne outbreak in Montreal caused over 5100 persons to be stricken with typhoid fever, and killed over 500 of them. Fortunately most disease outbreaks caused by unsafe milk are not nearly so serious as the Montreal outbreak, but the United States Public Health Service receives reports each year of from 30 to 50 outbreaks.

This fact is tremendously significant to all of us who drink milk—and especially to all of us who have children.

Among the diseases which may be transmitted through milk are tuberculosis, typhoid fever, scarlet fever, diphtheria, septic sore throat and undulant fever. Let us confine ourselves for the moment to but three of them—tuberculosis, typhoid fever and septic sore throat.

Suppose you were a dairyman. What would you do, short of pasteurization, to make sure that none of your customers would ever contract any of these diseases by drinking your milk?

Well, in the case of tuberculosis, almost the only thing you could do would be to have your cows tested for tuberculosis and kill those that showed they had it.

Suppose you did that. Suppose you had a herd of 50 splendid, purebred cattle, that you had them all tested, found 3 or 4 of them to be tuberculous, had 3 or 4 slaughtered, and then continued with your business. Would you have protected your customers from contracting bovine tuberculosis? If I were one of your customers, could you give me real assurance that I would never regret having permitted my children to drink the milk from your dairy?

Certainly the four you had slaughtered would no longer be a menace. But suppose that a year later, when you came to test again, you found another cow to be tuberculous. Then you would face a very serious question. You would wonder how many months it had been tuberculous. You would be assailed by the disturbing thought that perhaps some innocent child had received through your milk supply the germs of tuberculosis, an infection which might not disclose

itself until considerable time had elapsed, until, perhaps, the child and the parents had forgotten that you had ever been their dairyman.

Do not let anyone benumb your conscience into believing that this does not happen. It does happen, again and again, even at certified and grade A raw-milk dairies, and slaughtering the infected cows does not undo the damage they have already done.

Now let us pass on to typhoid fever. If you were the owner of a raw-milk dairy, what would be the most effective thing you could do, short of pasteurization, to make sure that your milk supply would not carry typhoid fever to your customers?

(Continued in next issue)

ANNOUNCE SEVENTH GORGAS ESSAY CONTEST

The seventh annual essay contest for high school juniors and seniors sponsored by the Gorgas Memorial Institute, Washington, D. C., is announced by Admiral Cary T. Grayson, president of the institute.

The contest opened in all high schools December 10th, and will close on Friday, February 15, 1935. The subject will be "Gorgas' Control of Transmissible and Other Preventable Diseases." The donors of the prizes are Mr. and Mrs. Henry L. Doherty, of New York City.

High school winners will receive a Gorgas medal, and will qualify for entrance in the State contest. State winners will be awarded \$10 in cash, and will qualify for entrance in the National contest. Winner of the first National prize will receive \$500 in cash, and a travel allowance of \$200 to Washington to receive the award; second National prize will be \$150 in cash, and third National prize \$50 in cash.

Winner in each high school will be selected by a faculty committee appointed by the principal. The winning essay, with official entrance blank and photograph of the winner, will be forwarded by the principal to the Gorgas Institute, for entry in the State contest. A committee of three State officials will judge the winning school papers and select the winner in each State. The winning State essays will then be entered in the National contest, the judges of which will be the U. S. Commissioner of Education, the Surgeon General of the U. S. Public Health Service and the Director General of the American College of Surgeons. Eighteen thousand five hundred students participated in the last contest.

For detailed announcement and instructions write to the Gorgas Memorial Institute, 1835 I Street, N. W., Washington, D. C.

MORBIDITY

Complete Reports for Following Diseases for Week Ending
December 15, 1934

Chickenpox

447 cases: Alameda County 1, Berkeley 4, Oakland 52, Piedmont 2, San Leandro 4, Butte County 1, Richmond 1, Placerville 1, Fresno County 2, Fresno 2, Bakersfield 1, Kings County 2, Los Angeles County 17, Alhambra 2, Beverly Hills 1, Burbank 7, Huntington Park 1, Long Beach 15, Los Angeles 40, Pasadena 10, Pomona 4, Redondo 8, Santa Monica 2, South Pasadena 1, Torrance 2, Madera County 1, Madera 3, Marin County 1, Merced County 4, Monterey 1, Orange County 13, Huntington Beach 4, Riverside County 12, Riverside 7, Sacramento 13, San Bernardino County 1, Ontario 2, Redlands 1, San Diego County 1, Chula Vista 3, San Diego 4, San Francisco 44, San Joaquin County 32, Manteca 6, Paso Robles 1, Burlingame 2, San Mateo 6, Santa Maria 11, Santa Clara County 4, Gilroy 2, Palo Alto 4, Vallejo 1, Sonoma County 11, Petaluma 2, Stanislaus County 30, Sutter County 1, Trinity County 4, Tulare County 13, Ventura County 7, Yolo County 2, Davis 10.

Diphtheria

66 cases: Berkeley 1, Oakland 3, Los Angeles County 3, Beverly Hills 1, Los Angeles 22, South Pasadena 1, Torrance 1, Merced County 1, Huntington Beach 1, Santa Ana 1, Riverside County 4, Riverside 4, Sacramento 6, San Bernardino County 1, San Diego County 1, San Diego 2, San Francisco 2, San Joaquin County 3, Stockton 1, San Jose 1, Santa Cruz County 2, Ventura 4.

German Measles

31 cases: Berkeley 4, Oakland 1, Placerville 1, Fresno County 8, Los Angeles County 1, Long Beach 2, Los Angeles 4, San Bernardino County 2, San Diego 1, San Francisco 2, Stockton 1, Lompoc 1, San Jose 1, Watsonville 2.

Influenza

41 cases: Los Angeles County 5, Hermosa 1, Los Angeles 29, San Bernardino County 1, San Francisco 4, San Luis Obispo County 1.

Malaria

6 cases: Culver City 1, San Joaquin County 1, Lodi 1, California 3.*

Measles

174 cases: Berkeley 1, Oakland 2, Calaveras County 1, Richmond 1, Humboldt County 1, Taft 1, Los Angeles County 1, Long Beach 2, Los Angeles 5, Orange County 15, Anaheim 3, Orange 2, San Diego 2, San Francisco 12, San Joaquin County 43, Manteca 2, Stockton 16, Tracy 13, Paso Robles 1, Santa Barbara County 2, Santa Maria 29, San Jose 1, Santa Cruz 5, Watsonville 1, Stanislaus County 1, Modesto 1, Tulare County 9, Exeter 1.

Mumps

145 cases: Alameda County 2, Albany 1, Emeryville 1, Oakland 9, Richmond 1, Los Angeles County 2, Burbank 6, Glendale 1, Los Angeles 17, Pomona 1, Santa Monica 1, Whittier 1, Marin County 1, Corte Madera 1, Larkspur 1, Merced 1, Nevada County 8, Sacramento 3, San Bernardino County 1, San Diego 1, San Francisco 12, San Joaquin County 10, Lodi 7, Stockton 1, Tracy 4, San Luis Obispo 2, Santa Barbara County 9, Santa Maria 17, Santa Clara County 3, Gilroy 8, San Jose 1, Modesto 1, Tulare County 7, Lindsay 3.

Pneumonia (Lobar)

60 cases: Alameda County 1, Alameda 1, Berkeley 3, Oakland 7, Colusa County 1, Pinole 1, Los Angeles County 2, Huntington Park 1, Los Angeles 16, Manhattan 1, Monrovia 1, San Fernando 1, Gardena 1, Monterey County 2, Anaheim 1, Huntington Beach 1, Riverside 1, Sacramento County 1, Sacramento 3, San Bernardino County 1, San Diego 2, San Francisco 8, Santa Paula 1, Ventura 1, California 1.*

Scarlet Fever

371 cases: Alameda 3, Berkeley 1, Oakland 12, San Leandro 1, Colusa County 1, Contra Costa County 1, Crescent City 1, Fresno 2, Willows 2, Kern County 8, Bakersfield 1, Los Angeles County 19, Beverly Hills 1, Burbank 1, Claremont 1, El Monte 2, El Segundo 1, Glendale 2, Inglewood 1, La Verne 1, Long Beach 3, Los Angeles 69, Pasadena 4, South Pasadena 4, Torrance 4, Lynwood 1, Hawthorne 1, Madera County 2, Monterey 1, Orange County 2, Anaheim 2, Santa Ana 11, Laguna Beach 1, Tustin 1, Colfax 1, Riverside County 2, Corona 2, Riverside 3, Sacramento County 1, Sacramento 3, Redlands 2, San Diego County 5, Chula Vista 1, National City 3, San Diego 12, San Francisco 14, San Joaquin County 9, Manteca 2, Stockton 9, Tracy 1, Redwood City 1, San Mateo 1, Santa Barbara County 1, Lompoc 2, Santa Maria 3, Santa Clara County 2, Los Gatos 1, San Jose 3, Santa Cruz County 1, Santa Cruz 1, Solano County 3, Fairfield 1, Modesto 1, Sutter County 1, Tulare County 3, Tulare 1, Sonoma 1, Woodland 1, Yuba County 2, California 1.*

*Cases charged to "California" represent patients ill before entering the State or those who contracted their illness traveling about the State throughout the incubation period of the disease. These cases are not chargeable to any one locality.

Smallpox

16 cases: Los Angeles 15, California 1.*

Typhoid Fever

6 cases: Berkeley 1, Los Angeles County 1, Mendocino County 1, Merced County 1, Riverside County 1, San Joaquin County 1.

Whooping Cough

78 cases: Alameda 2, Berkeley 2, Oakland 1, Kern County 2, Los Angeles County 10, Burbank 3, Culver City 1, Long Beach 1, Los Angeles 5, Whittier 2, Orange County 3, Orange 9, Santa Ana 1, Hollister 2, San Diego County 1, San Diego 2, San Francisco 15, San Joaquin County 2, San Luis Obispo County 4, San Luis Obispo 1, Santa Barbara County 1, Gilroy 1, Palo Alto 2, Ventura County 2, Ventura 3.

Meningitis (Epidemic)

2 cases: Los Angeles 1, Lynwood 1.

Dysentery (Amoebic)

3 cases: Long Beach 1, Anaheim 1, Riverside 1.

Dysentery (Bacillary)

One case: Los Angeles County.

Ophthalmia Neonatorum

One case: San Francisco.

Pellagra

2 cases: Sonoma County 1, Tulare County 1.

Poliomyelitis

14 cases: Kern County 1, Taft 1, Kings County 3, Los Angeles 1, Sacramento County 2, Sacramento 1, Ventura County 1, Yolo County 1, Woodland 3.

Tetanus

One case: San Luis Obispo County.

Trachoma

9 cases: Los Angeles County 6, Riverside 3.

Paratyphoid Fever

One case: Los Angeles County.

Undulant Fever

4 cases: Los Angeles County 2, Glendale 2.

Coccidioidal Granuloma

One case: Sacramento.

Septic Sore Throat (Epidemic)

5 cases: Berkeley 3, South San Francisco 2.

Rabies (Animal)

16 cases: Oakland 1, Los Angeles County 2, Glendale 1, Long Beach 1, Los Angeles 4, Gardena 1, Monterey County 1, Monterey 3, San Diego 1, Stockton 1.

One of the most important lessons that we should appreciate is the great complexity and the vast scope of the field of public health. It is not a definite science but comprises a great body of knowledge about as broad as experimental science itself. For that reason the study of public health should be excellently adapted for general educational purposes. In this field, not only are the fundamentals of practically every laboratory science applied, but here is ample opportunity for the study of classics, the humanities, social problems and economics; for all civilizations have been profoundly influenced by problems of health and disease.—D. J. Davis, *Illinois Medical Journal*, November, 1929.

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